

A FEW AURAL NOTES

Diagnostic
and
Therapeutic

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To the Members of the Medical Profession
with the Compliments of the Manufacturers of
FELLOWS COMPOUND SYRUP
of **HYPOPHOSPHITES**

PREFACE

MOST of the common affections of the ear, in their early stages, come to the notice of the General Practitioner.

It is therefore to recall and to describe briefly some of these conditions, to explain their significance, and to present some practical information concerning their diagnosis and treatment that this brochure has been prepared.

The Publishers therefore hope that it may be found of some slight use to that greater portion of the Medical Profession engaged in general practice.

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THE FELLOWS MEDICAL MFG. CO., INC.
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PRACTICAL MEMORANDA

CONCERNING THE EAR AND ITS DISEASES.

THE auditory apparatus is divided, anatomically, into three portions: the external ear, the middle ear, and the internal ear.

A complete examination of the ear, which should include both ears, comprises: Diagnostic Methods

- (1) a direct inspection of the external ear;
- (2) an inspection of the external auditory canal and tympanic membrane with the aid of aural specula and reflected light;
- (3) a determination of the acuity of hearing and an investigation of the phenomena accompanying its reduction; and
- (4) a determination of the patency of the Eustachian tubes and the mobility of the drum membrane.

The nares should also be examined with a nasal speculum and reflected light, and the nature and extent established of any existing deformities, inflammation, or growths. An examination of the throat and naso-pharynx will then determine the condition of the tonsils, the pharyngeal mucous membrane, and the presence or absence of adenoids.

The acuteness of hearing is determined by the Watch Test and the Voice Test applied separately to each ear. During both the watch and the voice tests the eyes of the patient should be closed, in order that lip-reading may not be possible, and that the distance of the watch or the speaker may not influence the patient. In tests relative to differential diagnosis and prognosis the tuning fork is used. Testing the Hearing

Weber's Tuning Fork Test Weber's Test. In this Test a C₂ tuning fork, having 512 vibrations per second, is vibrated and the handle placed against the upper central incisor teeth or upon the middle line of the cranium. If the sound is heard better in the afflicted ear it is indicative of some affection of the conducting apparatus, as middle ear disease, impacted cerumen in the external auditory canal, or occlusion of the Eustachian tube; while if heard better in the normal or less afflicted ear, it is the perceptive, or nerve, apparatus that is at fault.

Rinné's Test Rinné's Test depends upon the fact that the normal ear is more sensitive to sounds transmitted through the air than to those transmitted by the bony framework of the ear. In a normal ear, if the handle of a vibrating C₂ (512 vibrations) tuning fork is held against the mastoid until the patient no longer hears any sound, and then the free tips of the fork be brought close to the external ear, the sound will be heard again. This is known as *positive Rinné*. If, however, the sound is not heard again when the fork is thus transposed, it is known as *negative Rinné*. In a defective ear, a negative Rinné shows a relative reduction of aerial conduction or a similar increase in bone conduction and indicated obstruction or disease of the normal conducting apparatus; while a positive Rinné, in a defective ear, is an indication of a lesion in the perceptive apparatus of the internal ear.

The Schwabach Test The Schwabach Test depends upon the fact that in middle ear disease, a fork vibrating in contact with the cranium is heard longer in an affected than in a normal ear. When the auditory nerve is affected, it is heard longer by the normal ear. The fork is struck and placed on the patient's mastoid, and when the patient ceases to perceive the sound, the fork is transferred to the examiner's mastoid. If still heard by the normal ear of the examiner, it indicates labyrinthine disease in the patient. If not heard, the test is reversed, the examiner first placing the vibrating fork on his own mastoid, and, when the sound has died

away, transfers it at once to the patient's. If heard by the patient after the examiner's normal ear has ceased to hear it, an obstruction of sound conduction, but not disease of the nerve, is indicated. Politzer values this test in the diagnosis of nerve involvement, and, in prognosis, as indicating favorable results of treatment when the sound perception is prolonged through the cranial bones.

A negative Rinné Test indicates middle ear disease, which should be partly or entirely benefited by treatment. A positive test indicates nerve deafness which, with a few exceptions, implies an unfavorable prognosis. The Schwabach Test deduces an abnormal condition of the conducting apparatus (middle ear) when bone conduction is lengthened and, conversely, disturbance of the nervous mechanism when bone conduction is impaired. The Weber Test is only valuable in indicating disease of the perceptive apparatus in unilateral deafness, when the sound is accentuated in the normal ear; the chief objection to the test being the uncertainty of the localization of the auditory perception in one ear. Tuning-fork tests are said to be of value as aids to prognosis when they point to middle ear disease. However, the deductions drawn from these tests should be used with caution as the pitch and intensity of the sounds employed may sometimes cause them to vary and even to be the direct opposite of what the formulated rules would lead us to expect. Even with indications of a diseased perceptive apparatus, supported by many tests, an unfavorable prognosis should be withheld until treatment has been administered and found unavailing.

Interpreting
the Tests

Inflation of the middle ear is used in both diagnosis and treatment; but some authorities deny that the passage of a current of air through the Eustachian tube has any permanent therapeutic influence on a chronically diseased ear. It is also held that no beneficial action is exerted on the mucosa by the use of medicated vapors. As a diagnostic measure it is employed to ascertain the patency of the Eustachian

Inflating the
Middle Ear

tubes; for determining the presence or absence of exudate in the middle ear; for detecting perforation of the membrana tympani; and, in the absence of a Siegle's pneumatic otoscope, for determining the mobility of the membrana. As a therapeutic measure inflation is employed in tubal and middle ear disease to relieve hyperæmia of the tympanic and tubal mucous membrane, for breaking down adhesions and in clearing both tube and tympanum of morbid secretions.

Inflation with medicated vapors, instead of with plain atmospheric air, is sometimes employed.

The middle ear may be inflated:

- (1) by Valsalva's Method,
- (2) by Politzer's Method, and
- (3) by the Eustachian catheter.

Valsalva's Method (1) After taking a deep breath and closing the mouth the patient should hold his nose tightly closed, exhale forcibly, thereby filling out the cheeks, and swallow. The confined air is thus forced up the Eustachian tubes and into the tympani, where its increased pressure is manifested by the bulging of the "drums" and, generally, by temporary reduction of hearing. This is the simplest but the least reliable method of inflation, and patients should be cautioned against a too frequent use of this procedure.

Politzer's Method (2) The patient is given a teaspoonful or two of water, which is held in the mouth until he is told to swallow. The nose piece of a Politzer bag is inserted for a distance of about one-half an inch into one of the patient's nostrils, and both nostrils are then kept closed by means of the thumb and forefinger of the examiner's left hand. The patient is then told to swallow, and as the larynx is seen to rise at the commencement of the act of swallowing, air is forced through the tubes into the middle ear, by the forcible compression of the bag. In children, crying acts similarly to swallowing in the application of this method. Too great force must not be exerted lest the membrane be ruptured or other damage be done.

(3) The curved end of a sterilized and unob-
structed Eustachian catheter, held tip downward, is
introduced into the inferior meatus of the nose, and,
raising the shaft of the catheter from the vertical to
a horizontal position, the tip is guided back until it
touches the posterior pharyngeal wall, when it is
rotated outward through an angle of somewhat more
than 90 degrees, until it rests in Rosenmüller's fossa.
The catheter is then withdrawn about one-quarter of
an inch until the tip slips over the posterior lip of
the Eustachian orifice, when the rotation is continued
until the external guide ring points to the outer
canthus of the eye of the same side. A gentle fore
and aft movement should now show the tip to be
within the Eustachian orifice. In this position, the
examiner's ear should be connected with the patient's
by the auscultation tube, the nozzle of a Politzer bag
inserted into the free extremity of the catheter, and
the ear inflated gently by compressing the bag.

Employing
the
Eustachian
Catheter

Through using the auscultation tube to connect the
external auditory canal of the ear inflated with that
of the operator, certain knowledge is gained by noting
the sounds produced by the air forced into the pa-
tient's middle ear. The normal sound is of a blowing
character. A full dry sound denotes a wide tube and
abnormal dryness. Râles accompany catarrhal
changes, and if they appear of uncertain and remote
origin, may proceed from tubal disturbance, while
if near and as though produced in one's own ear, are
usually of tympanic origin. When the Eustachian
tube is obstructed, the sounds are thin, weak, distant,
sibilant, or interrupted. In perforations of the mem-
brane the sounds may vary widely, but have a char-
acteristic quality and appear disagreeably near.

Auscultation
and Inflation

Always test a patient's hearing before inflating the
middle ear. The hearing should also be tested after
inflation, in order to note and record the immediate
effect. If, in a case of partial deafness from non-
perforative middle ear catarrh, inflation produces no
effect or increases the deafness, the prognosis is gen-
erally unfavorable, while it is generally favorable if
the inflation is followed by a temporary improvement.

Immediate
Effects of
Inflation
upon the
Hearing

THERAPEUTIC MEASURES

The Ear Syringe **S**YRINGING the ear is indicated for the purpose of removing foreign bodies and cerumen from the external auditory canal; but according to the latest authorities syringing, as a therapeutic measure in otology, has a very limited field. The syringes mostly used are of the common metal, glass, or hard rubber plunger type.

In using the ear syringe undue force must not be employed, and this is particularly important when the tympanum is exposed through the destruction of a considerable portion of the drum membrane. A blunt, fairly slender conical nozzle that, when introduced, does not completely occlude the external auditory meatus should be used, and not the ordinary olive-shaped tip which plugs the orifice of the canal and impedes the free return flow of the solution.

The syringe or other irrigating apparatus employed must be sterile. The solutions generally used are a normal saline, a saturated solution of boric acid, or a solution of bichloride of mercury (1-5000 to 1-10,000), and should be injected at a temperature of 100° F.

Rupture of the Membrana Tympani Rupture of the drum-head may result from the direct impact of a foreign body; from the instruments used in extracting a foreign body from the external auditory canal; from the sudden compression of the air in the auditory canal by a fall, a blow upon the ear, or by close proximity to a big gun in action; from the abuse of Politzer's air bag, of Siegle's pneumatic speculum, or even from a violent blowing of the nose. The drum-head may or may not be ruptured in fractures of the base of the skull.

Perforation of the membrana, unless prevented by incision, occurs in the majority of cases of acute suppurative inflammation of the middle ear.

Earache A not infrequent cause of recurring earache among infants and children is the temporary obstruction of the Eustachian tube, with resulting negative pressure in the middle ear. An attack is usually of relatively

short duration and is relieved spontaneously through the restoration of vaso-motor control and resulting equalization of pressure within and without the tympanum. Moist heat, both to the throat and the ear applied by steaming the throat and sipping or gargling with hot water and dropping hot water into the external auditory canal will generally suffice to relieve this non-suppurative type of middle ear disturbance. This form of earache is not infrequent during dentition, and adenoids plainly predispose to it.

Another common cause of earache among both children and adults, and one often productive of permanent injury to the auditory apparatus, is **Otitis Media Purulenta Acuta** Suppurative Inflammation of the Middle Ear. It usually involves the mucous lining of the Eustachian tube, and frequently that of the mastoid cells. It follows infection, which takes place from the nasopharynx by way of the Eustachian tube. The micro-organisms most commonly found in otorrhœal pus are the staphylococcus aureus and albus, the pneumococcus, and the streptococcus.

Middle ear infection in most instances is due to colds, but frequently it follows diphtheria, influenza, acute tonsillitis, the exanthemata, etc. Chronic nasal catarrh and decayed teeth are sometimes responsible; while high diving, sea-bathing and the careless use of a nasal spray or douche may sometimes cause it. **Causes**

Severe earache is often an early and important symptom, while fever may be also present. In addition to the pain, there is a distinct sense of fullness in the ear, with deafness, tinnitus, and sometimes vertigo. An early examination will generally find the drum-head to be dulled, reddened, or bulging; although, on the other hand, it may be normal in appearance. If the symptoms are not unduly severe and no bulging of the membrane is observed, the condition may be treated expectantly, at least for a few hours, with hot fomentations both to the ear and to the throat, as above described. The application of leeches will frequently relieve acute pain. Where, however, the condition does not readily yield to the simpler methods, the drum membrane should be promptly and freely incised. **Symptoms**

Spontaneous perforation of the membrane should be avoided by an early operation.

Incision of the Membrana Tympani Incision of the membrana tympani is a minor surgical procedure that should be practiced more frequently. It should be performed not only in order to relieve immediate disturbing symptoms, but to prevent the extension of infection and of inflammation; to limit the destruction of involved structures; and to conserve the hearing. After the incision, syringing may suit one case, and dry treatment another.

Indications In all cases of well-developed acute otitis media, for it is better to operate than to delay, but incision of the membrane is imperatively indicated by the bulging of the membrane from pressure within the tympanum; by the evidence of systemic infection from absorption of pent-up products of inflammation; by extreme local pain; by mastoid tenderness; or by other signs of impending mastoiditis or meningitis.

Operation Fill the external auditory canal with a hot solution of cocaine in alcohol—grs. V in $\mathfrak{Z}\ddagger$. This solution should be allowed to remain one or two minutes in an effort to sterilize the canal and to effect a certain amount of anæsthesia of the drum-head.

Through an ample aural speculum and with good illumination obtained from an electric head-lamp or illuminated speculum, or reflected by means of the head mirror, the external canal should be dried by wiping with cotton pledgets, and the membrana well exposed. The *tip* of a small, narrow, sharp knife should then be inserted, edge upward, near the floor of the meatus in the postero-inferior quadrant of the membrane, and made to sweep upward toward the vault, effecting a slightly curved incision more or less parallel to the posterior wall and equalling in length about two-thirds the long diameter of the membrane. The incision must be done with the tip of the knife so as to avoid injury of the inner tympanic wall, which, in the region involved, is generally about one-eighth of an inch from the membrana.

Opening the Attic If there is localized bulging, the incision should include it. With the involvement limited to the attic,

the incision should be carried from a point posterior to the short process of the malleus upward through Shrapnell's membrane.

Simple puncture, or paracentesis tympani should, where drainage is the object, give place to more free incision of the drum membrane; still, where the necessity for operation exists and where, through lack of proper facilities free incision of the membrane is not attempted, simple puncture may well be carried out.

The preparation of the patient for paracentesis is the same as for incision. The point of an angular myringotome or similar instrument is passed through the membrane, either at the point of bulging or in the postero-inferior quadrant, until it touches the opposing tympanic wall, and then withdrawn. Relief of pain and of other symptoms of pressure usually follow this procedure.

With small children, general anæsthesia is sometimes necessary, not only for the operations of incision and paracentesis tympani, but even for a proper examination of the ear.

Chronic non-suppurative inflammation of the mucous membrane and submucous tissues of the middle ear is a common cause of progressive deafness, and is generally the result of an extension of similar processes in the naso-pharynx through the Eustachian tubes. In most instances the disease progresses by continuity of structure from the pharyngeal mouths of the Eustachian tube into the tympanum, while in others stenosis of the tube, from swelling of the lining mucous membrane or from an accumulation of secretions, interferes with the proper ventilation of the tympanum and causes engorgement of its capillaries, and hypertrophic and hyperplastic changes, which lead to loss of function and tend to subsequent atrophy.

In the treatment of chronic aural catarrh, its relation to pathologic conditions within the nose and the throat must receive due consideration. The best results are attained in cases of but limited ear involvement in which abnormal conditions in the nose

and throat are promptly remedied. In most cases, the progress of the disease can be delayed, but when new connective tissue has formed, it remains, and atrophied parts cannot be regenerated.

Consequences of Otitis Media Extensive destruction of the structures of the middle ear may be occasioned by acute otitis media, and especially when the disease occurs as a complication of scarlatina, variola, or diphtheria. The whole of the drum-membrane and all of the ossicles may come away as an enormous slough within a few days from the onset of the middle ear disease. In other cases, more slowly proceeding ulceration accomplishes equally disastrous results. Mastoiditis is by no means of infrequent occurrence, and may lead to most serious intercranial complications—meningitis, brain abscess, and sinus thrombosis.

Mastoiditis It should be remembered that a cessation of the discharge following incision of the membrana tympani is no positive indication that the mastoid be not involved. After an operation for otitis media, persistent headache and insomnia should be regarded with suspicion.

Symptoms of aid to diagnosis. The character of the discharge is also a valuable A staphylococcus infection is usually mild in character, and an extensive mastoid involvement not frequent. On the contrary, a streptococcus infection requires considerable attention, and the mastoid process should be explored earlier.

A very significant sign is the apparent shortening of the meatus, not the well-known bulging of the drum membrane which occurs in every case of acute otitis with an accumulation in the tympanic cavity, but the actual shortening of the external meatus, when the entire drum membrane appears abnormally near to the entrance of the canal.

The external auditory canals are symmetrical—similar in appearance. Asymmetry between the two canals is always to be looked upon with suspicion, and if otitis media be present, narrowing of the canal is almost pathognomonic of a mastoid involvement.

X-rays in Diagnosis In doubtful cases skiagraphy is frequently of value, and the evidence thus supplied is rarely misleading. Transillumination may also prove useful.

In the presence of mastoid tenderness or pain, in **Treatment** addition to incision of the membrana, an ice-bag should be applied behind the ear. Among children, it is not uncommon for signs of cerebral irritation to disappear upon incision or rupture of the drum membrane; while in most cases the pain subsides and the temperature drops in a few hours subsequent to the establishment of drainage through the external ear. When, however, this does not occur, or when intercranial complications arise, the mastoid should be opened and drained. If doubt exists as to the health of the meninges, the middle and posterior fossæ should be opened and inspected—a perfectly safe procedure if no violence is done the dura.

Suppurative Labyrinthitis should be considered as **Labyrinthine** most dangerous to life. Like other intercranial dis- **Disease** eases the diagnosis is uncertain.

The following points are suggestive of disease of **Auditory** the labyrinth or auditory nerve (Roosa): **Nerve**

Deafness

1. When the tuning-fork is heard better through the air.
2. When the power of hearing is better in a quiet place.
3. When noises are markedly annoying.
4. When inflation of the middle ear makes the hearing worse.

Among the various tests employed in the diagnosis **Baranay's** of labyrinthine disease that of Baranay is without **Test** danger and may prove of service. According to Baranay, when the vestibule is healthy the injection of water at a temperature of, say, 80° F. into the external auditory canal will develop a circular nystagmus towards the opposite side. On the other hand, if the temperature of the water be above that of the body, the nystagmus will be toward the ear syringed, while if the labyrinth be destroyed no nystagmus will develop.

Any causative factor such as syphilis should be **Treatment** treated; but strychnine hypodermically (gr. 1-30 or even more) and the constant current are the two methods of treating these cases. They are, however, generally of little use.

Quinine or salicylates should not be prescribed in nerve deafness.

Ménière's Disease Ménière's disease is a name given to a group of symptoms caused by certain disturbances in the labyrinth or central nervous system, more or less apoplectiform in character. It is characterized clinically by sudden loss of hearing, tinnitus, and vertigo to such a degree that often the patient is unable to maintain his equilibrium and falls to the ground. Usually the more alarming symptoms pass away within a few days leaving, however, some deafness, tinnitus, and vertigo which may remain for years, the deafness gradually increasing.

The persistent administration of Fellows' Syrup, together with moderate doses of iodide of potash, and occasional hypodermic injections of pilocarpin (gr. 1-16 to gr. 1-12) are recommended in the routine treatment of this disorder.

Deafmutism— From a study of 1,076 congenitally deaf children, **Congenital** Yearsley reports heredity and consanguinity to be **and Acquired** the most important factors; with alcohol, insanity, and syphilis, the most important minor causes. Of 592 cases of *acquired deaf-mutism*, 72.2 per cent. were due to suppurative or catarrhal middle ear disease, in which infectious fevers and adenoids played an important part. The importance of careful attention to all cases of suppuration of the ear in young children is urged.

From DR. FRANCISCO GIRALT,
Specialist in Aural Diseases, Havana, Cuba.

(Translated)

Dear Sirs:—I have pleasure in informing you that I have employed your Syrup of Hypophosphites in cases of otorrhoea of scrofulous origin and have obtained most satisfactory results.

(Signed) FRANCISCO GIRALT.

"OVER THERE"

From Médecin A. Major de Première Classe LIAUTARD.

Fort de la Bonnelle, Langres, Haute Marne,

April 29, 1917.

(Translated)

Dear Sirs:—I hasten to answer your letter of March 31st, and to thank you for the kind shipment you have already sent me. I have noticed with much pleasure the strikingly successful effects of Fellows' Syrup on my wounded comrades.

Docteur. Liautard

From DOCTOR FARCY,

Médecin A. Major, Hôpital Militaire de Briançon.

Hautes Alpes, November 23, 1917.

(Translated)

Dear Sirs:—I wish to transmit to you my sincere thanks for your shipment of 32 bottles of Fellows' Syrup, from which I have obtained the best results in the consolidation of splintered fractures caused by projectiles; in a case of Pott's Disease; and as a general tonic in many conditions arising from nervous debility or tuberculosis.

D. Farcy

From DOCTOR F. BRETON,

*Chief Medical Officer of the First Class, French Navy,
Retired.*

Nice, September 7, 1917.

(Translated)

Dear Sirs:—I have nothing but praise for Fellows' Syrup; it has given me the best results in greatly anæmic convalescents recovering from severe wounds, and in men whose nervous system was very much depressed. It has also given me equally good results in the case of an Arsenal worker who was suffering from tuberculosis in the second degree.

This syrup increases the strength, it exerts a sedative action on the nervous system, and constitutes a good therapeutic agent which is well tolerated.

F. Breton

Fellows' Syrup of Hypophosphites

contains the chemically pure hypophosphites of potassium, manganese, calcium; together with iron, quinine and strychnine (each fluid drachm contains the equivalent of 1-64th of a grain of pure strychnine), agreeably blended in the form of a bland, stable syrup.

In order to insure satisfactory results, the genuine **FELLOWS' SYRUP** should be prescribed. It differs from other preparations of the Hypophosphites, and among its distinguishing characteristics are:

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- Quality of retaining Strychnine in solution for an indefinite period;
- Potency against debility and disease;
- Fifty years of successful application by leading specialists in all parts of the world.

Fellows' Laxative Tablets (of Cascara Compound)

Small, sugar-coated, yellow tablets of exceptional efficiency in the relief of Constipation, Indigestion, and the many ills resulting from Hepatic Insufficiency.

Especially recommended when a laxative is required in conjunction with

FELLOWS' SYRUP